AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. – 7. (Canceled)

8. (Currently Amended) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

an outer chamber surrounding the vacuum processing chamber connected with an evacuation means;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for generating plasma therebetween and providing the vacuum processing chamber;

an electrode cover made of silicon being provided at the outer surface of the upper electrode; and

a discharge confining means comprised of SiC for separating the vacuum processing chamber from the outer chamber and for increasing plasma ~~densiry~~ density in the vacuum processing chamber .

9. (Previously Presented) The plasma processing apparatus according to claim 8; the lower electrode having a sample mounting surface; said apparatus

further comprising a susceptive cover comprised of silicon near the sample mounting surface.

10. (Previously Presented) A plasma processing apparatus comprising:

a vacuum processing chamber for processing a sample, including an insulator film, by using plasma;

a gas supplying unit for introducing into the vacuum processing chamber a fluorine-containing processing gas;

an upper electrode and a lower electrode for providing the vacuum processing chamber therebetween;

an outer chamber surrounding the vacuum processing chamber and connected with an evacuation means;

a high frequency electric power source for supplying a high frequency energy for generating plasma between the upper electrode and the lower electrode;

a bias electric power source connected to the lower electrode to control energy of ions in the plasma;

an electrode cover comprised of silicon being provided at the outer surface of the upper electrode;

a susceptive cover comprised of silicon being provided near a sample mounting surface of the lower electrode; and

a discharge confining means comprised of SiC for separating the vacuum processing chamber from the outer chamber and for increasing plasma density in the vacuum processing chamber .

Claim 11. (Canceled)

12. (Previously Presented) The plasma processing apparatus according to claim 10, wherein the discharge confining means includes at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

13. (Previously Presented) The plasma processing apparatus according to claim 8, wherein the discharge confining means is ring-shaped.

14. (Previously Presented) The plasma processing apparatus according to claim 9, wherein the discharge confining means is ring-shaped.

15. (Previously Presented) The plasma processing apparatus according to claim 10, wherein the discharge confining means is ring-shaped.

16. (Previously Presented) The plasma processing apparatus according to claim 8, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

17. (Previously Presented) The plasma processing apparatus according to claim 9, wherein the discharge confining means is provided with at least a gap for

evacuating the processing gas from the vacuum processing chamber to the outer chamber.

18. (Previously Presented) The plasma processing apparatus according to claim 13, wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

19. (Previously Presented) A plasma processing apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

an upper electrode and lower electrode having plasma generated therebetween;

an electrode cover made of silicon provided at the bottom surface of the upper electrode; and

a discharge confining means comprised of SiC for defining a surrounding vacuum processing chamber in the vacuum container in the space between said upper and lower electrodes and for increasing plasma density in the vacuum processing chamber.

20. (Previously Presented) The plasma processing apparatus according to claim 19:

wherein said lower electrode includes a sample mounting surface, and further comprising a susceptive cover around the sample mounting surface, and wherein said susceptive cover is also made of silicon.

21. (Previously Presented) A plasma processing apparatus comprising:

a vacuum container for processing of a sample including an insulator film through the use of plasma;

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

an upper electrode and lower electrode for defining a vacuum processing chamber therebetween;

a high frequency electric power source for supplying a high frequency energy for generating plasma in the vacuum processing chamber;

a bias electric power source connected to the lower electrode to control the energy of ions in the plasma;

an electrode cover made of silicon being provided at the bottom surface of the upper electrode;

a susceptive cover made of silicon provided around a sample mounting surface of the lower electrode; and

a discharge confining means made of SiC for surrounding the vacuum processing chamber in the vacuum container and for increasing plasma density in the vacuum processing chamber.

22. (Previously Presented) The plasma processing apparatus according to claim 21 further comprising an outer chamber defined within the vacuum container outside of the vacuum processing chamber, said outer chamber being connected with an evacuation means.

23. (Previously Presented) The plasma processing apparatus according to claim 21 wherein the discharge confining means includes at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

24. (Previously Presented) The plasma processing apparatus as in claim 19 wherein the discharge confining means is ring shaped.

25. (Previously Presented) The plasma processing apparatus according to claim 19 and further comprising an outer chamber defined in said vacuum container outside of said vacuum processing chamber and wherein the discharge confining means is provided with at least a gap for evacuating the processing gas from the vacuum processing chamber to the outer chamber.

Claim 26. (Canceled)

27. (Previously Presented) A plasma etching apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

an upper electrode and lower electrode having plasma generated therebetween;

wherein said plasma etching apparatus further comprises:

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

means for generating a plasma between said upper electrode and lower electrode to etch a fine pattern on the sample having a diameter of 300 mm or more;

a bias electric power source connected to the lower electrode to control energy of ions in said plasma;

a discharge confining means comprised of SiC for defining a vacuum processing chamber in the space between said upper and lower electrodes in the vacuum container and for increasing plasma density in the vacuum processing chamber;

an electrode cover provided at the bottom surface of the upper electrode, wherein the electrode cover is made of silicon and includes holes to pass the processing gas;

a susceptive cover, made of silicon, provided around a sample mounting surface of the lower electrode.

28. (Previously Presented) A plasma etching apparatus comprising:

a vacuum container for processing a sample including an insulator film by use of plasma;

an upper electrode and lower electrode having plasma generated therebetween;

wherein said plasma etching apparatus further comprises:

a gas supplying unit for introducing into the vacuum container a processing gas containing fluorine;

means for generating a plasma with a density of 5×10^{10} cm^{-3} to 5×10^{11} cm^{-3} between said upper electrode and lower electrode to etch a fine pattern on the sample ;

a bias electric power source connected to the lower electrode to control energy of ions in said plasma;

a discharge confining means comprised of SiC for defining a vacuum processing chamber in the space between said upper and lower electrodes and for increasing plasma density in the vacuum processing chamber;

an electrode cover provided at the bottom surface of the upper electrode, wherein the electrode cover is made of silicon and includes hole to pass the processing gas; and

a susceptive cover made of silicon provided around the sample mounting surface of the lower electrode.

29. (Previously Presented) A plasma processing apparatus according to claim 19, wherein the vacuum container includes an outer chamber, connected with an evacuation means, surrounding the vacuum processing chamber, and wherein the discharge confining means is located to serve as means for separating the vacuum processing chamber from the outer chamber.

30. (Previously Presented) A plasma processing apparatus according to claim 21, wherein the vacuum container includes an outer chamber, connected with an evacuation means, surrounding the vacuum processing chamber, and wherein the discharge confining means is located to serve as means for separating the vacuum processing chamber from the outer chamber.

31. (Previously Presented) A plasma etching apparatus according to claim 27, wherein the vacuum container includes an outer chamber, connected with an evacuation means, surrounding the vacuum processing chamber, and wherein the discharge confining means is located to serve as means for separating the vacuum processing chamber from the outer chamber.

32. (Previously Presented) A plasma etching apparatus according to claim 28, wherein the vacuum container includes an outer chamber, connected with an evacuation means, surrounding the vacuum processing chamber, and wherein the discharge confining means is located to serve as means for separating the vacuum processing chamber from the outer chamber.

33. (Previously Presented) A plasma processing apparatus according to claim 8, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.

34. (Previously Presented) A plasma processing apparatus according to claim 10, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.

35. (Previously Presented) A plasma processing apparatus according to claim 29, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.

36. (Previously Presented) A plasma processing apparatus according to claim 30, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.

37. (Previously Presented) A plasma etching apparatus according to claim 31, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.

38. (Previously Presented) A plasma etching apparatus according to claim 32, wherein the discharge confining means is located for maintaining a uniform reaction in the vacuum processing chamber.